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SOUTHWEST FISHERIES CENTER

NATIONAL MARINE FISHERIES SERVICE

SOUTHWEST FISHERIES CENTER

P.O. BOX 271

LA JOLLA, CA 92038

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WORKSHOP ON TUNA RESEARCH PLANNING
San Clemente, California
September 11-13, 1979

BY
DAVID MACKETT

VOLUME I of 2-SUMMARY OF THE WORKSHOP

ADMINISTRATIVE REPORT LJ-79-42

A SUMMARY REPORT ON THE SOUTHWEST FISHERIES CENTER
WORKSHOP ON TUNA RESEARCH PLANNING

SAN CLEMENTE, CALIFORNIA

September 11-13, 1979

David Mackett

SWFC Program Planning Officer

Workshop Coordinator

VOLUME I of 2 - SUMMARY OF THE WORKSHOP

VOLUME II of 2 - SITUATION REPORTS PRESENTED TO THE WORKSHOP

ADMINISTRATIVE REPORT NO. LJ-79-42

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EXECUTIVE SUMMARY OF WORKSHOP

WHAT: Southwest Fisheries Center Workshop on Tuna Research Planning

WHERE: San Clemente, California

WHEN: September 11-13, 1979

WHO: SWFC Center Director and staff; Honolulu Laboratory Director and staff; Chief, Oceanic Fisheries Resources Division, La Jolla and staff; Leader, Albacore Fisheries Investigations; Southwest Regional Director and staff; NMFS Office of Science and Environment representative.

HOW: Review of status of the world's tuna stocks in 13 separate reports covering 23 stocks; assessment and projection of research needs and capabilities; program emphasis decisions followed by assignments for planning and operations.

MAJOR RESULTS:

- SWFC to increase research efforts for developing new analytical methods and models useful for stock assessment and fishery management, especially for North Pacific albacore.
- Increase data collection and monitoring activities for western Pacific tunas.
- Billfish research activities to be reassessed and possibly modified.
- SWFC formation of subtask for developing a new tuna management model.

- Formation of SWFC task force to investigate the fish-environment part (submodel) of the management model especially for North Pacific albacore.
- Center-wide tuna data management procedures will be addressed during the next year.

INTRODUCTION

The Southwest Fisheries Center's Workshop on Tuna Research Planning was held at the San Clemente Inn, San Clemente, California on September 11-13, 1979. A total of 22 persons participated including 19 from the SWFC, 2 from NMFS, Southwest Regional Office and 1 from NMFS Office of Science and Environment. A list of attendees and their organizational affiliation is given in Appendix 1. David Mackett, Planning officer for the SWFC was the Workshop coordinator.

The purpose of the Workshop was to review the situation regarding a number of tuna and billfish stocks of importance to the U.S. and to improve the Center's near-term and long-range tuna research plans. Before the Workshop began 13 Situation Reports written by SWFC staff, covering some 23 different species or stocks of Atlantic, Pacific and Indian Ocean tuna and billfish, were distributed to the participants. These reports set out a short description of the fishery, presented overviews of the current research programs going on in the world, and discussed the status or condition of the stocks. Recommendations for further analyses, data collection or research programs regarding the fishery were also given. The Situation Reports included most of the world's tuna stocks of direct or indirect interest or importance to the U.S. commercial and recreational fishermen, canning industry and consumers. A list of the reports is given in Appendix 2.

Authors presented highlights of the reports to the Workshop and questions and comments were solicited from the group. Rapporteurs were assigned the responsibility for summarizing the data availability, status of stocks and research needs for each major fishery. On the basis of the reports and discussions and rapporteurs' summaries, the Center Director, Honolulu Laboratory Director and the Chief, Oceanic Fisheries Resources Division (OFRD), meeting as the Tuna Program Board (TPB), made a number of decisions regarding future program emphasis and direction. These decisions were discussed in the Workshop and subsequent assignments were made for completing and documenting the work plans. Appendices 3 and 4 set forth the Agenda and Workshop procedure, respectively.

The Workshop concentrated on the stock assessment and fishery evaluation aspects of the Center's tuna research program, but some time also was devoted to a discussion of the tuna-environment interaction studies. The presentations and discussions were held in the context and framework shown in Figure 1, which exhibits the elements contributing to the overall goal of the Center's tuna research program, i.e., the delivery of tuna management information and advice to U.S. commissioners, negotiators and fisheries managers, both in the international and national arenas.

The results of the workshop are summarized in two sections of Volume I: i) Summary of Program Planning Decisions and Actions, and ii) Summaries of the Tuna Situation Reports regarding the world's tuna stocks and fisheries, including rapporteurs' summary tables of the status of stocks and research needs for each major fishery. Volume II is a compendium of the situation reports.

SWFC TUNA PROGRAM: FUNCTIONAL MODEL

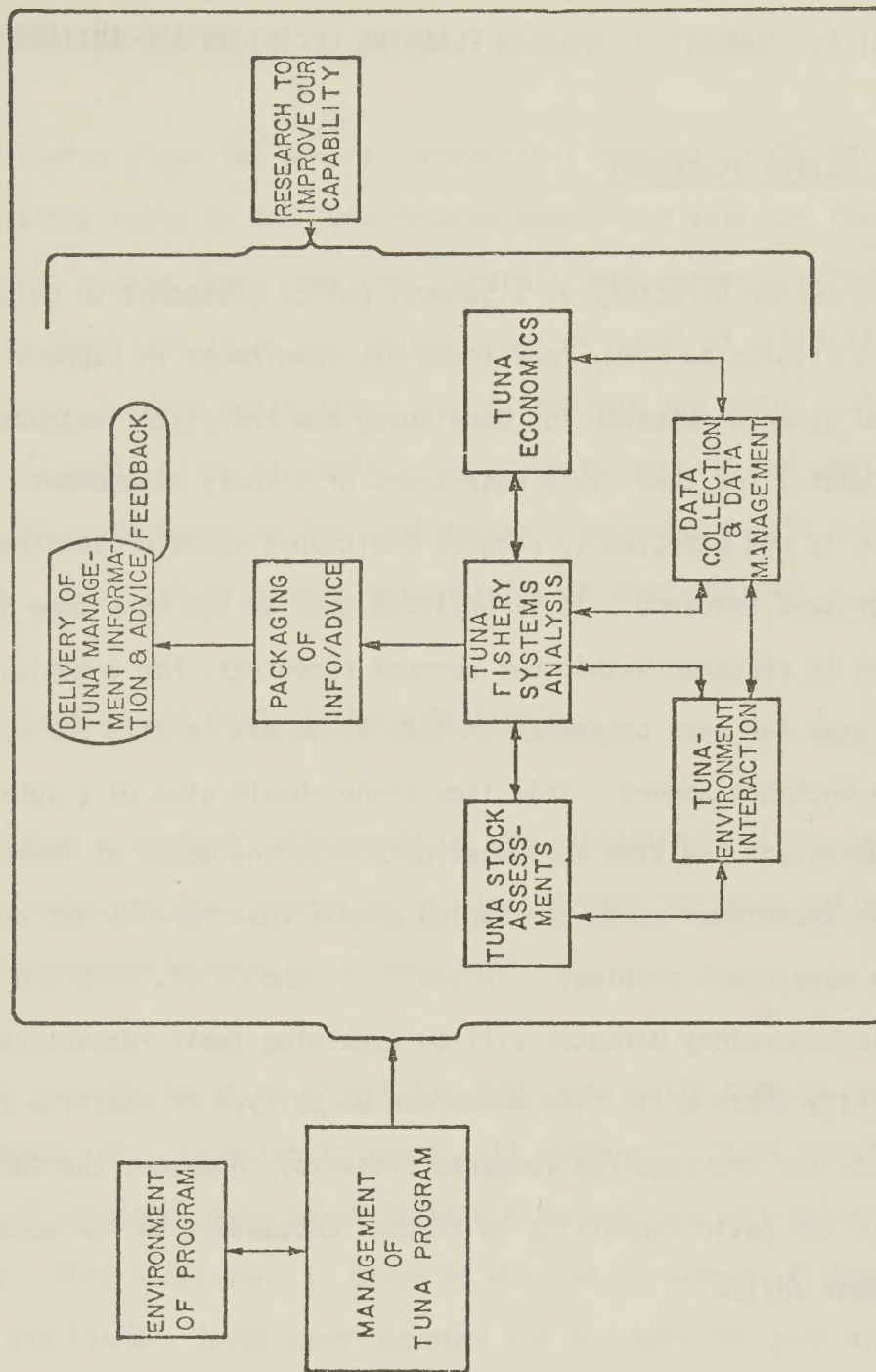


Figure 1. The SWFC's Tuna Program is geared to the delivery of tuna management information and advice to U.S. commissioners and U.S. negotiators. Several functions must be performed to deliver the information required for good management decisions; these functions include stock assessments, economic analysis, data management, analysis of fish environment interactions and a system analysis function that ties the specialized information together. Research in any or all elements may be required to improve overall quality; management of the program, because of its diversity and complexity, must usually be given special consideration.

PART 1: SUMMARY OF PROGRAM PLANNING DECISIONS AND ACTIONS

General Policy Statement

The Center Director, as a general policy statement to guide the Center's efforts in FY80, reaffirmed his commitment to support the required generic research for developing new analytical methods and models useful for tuna stock assessment or fishery management. Although the SWFC is not expected to receive additional funds or ceilings in FY80 for tuna research, it is believed that we can make some important progress in research within our current resources. For example, we do not foresee the same pressures in FY80 as we did in FY79 for developing outside Workshop papers. This item alone should give us a substantial opportunity and the time to investigate ways and means of improving our analysis techniques or in developing models that improve our understanding of tuna management problems. In addition, the Chief, OFRD and the Honolulu Laboratory Director will be examining their respective programs to identify those activities which can be delayed or modified to provide resources for the required research projects. However, the SWFC must maintain its basic capability to respond adequately to the needs for management advice.

Program Emphasis Decisions

The following gives the general conclusions reached by the Workshop, and the decisions taken by the Tuna Program Board, and sets out the assignments for action items required. Overall tuna research efforts were classified by functions in an increasing order of level of sophistication and usefulness: 1) data collection, data management and basic fishery monitoring, 2) application of traditional stock assessment and analysis techniques, 3) development of improved analysis methods, models and forecasting. These are discussed sequentially in what follows:

1. Data Collection and Basic Fishery Monitoring

The Workshop attendees' assessment of the situation, and the level of work and resources that should be applied in FY80 for data collection and basic fishery monitoring activities was:

a) The current level of effort for SWFC data collection or monitoring is adequate for: i) Atlantic tunas, ii) eastern tropical Pacific yellowfin and skipjack, iii) South Pacific albacore, and iv) Indian Ocean tunas. This assessment is based on what we foresee as fishery management and fishery development demands for our services over the next 12-18 months.

b) It was decided that the SWFC efforts are "inadequate" to monitor properly i) central and western Pacific skipjack and yellowfin stocks, and ii) Pacific billfish.

c) It was decided that the Honolulu Laboratory would carry out a project (sub-task) to catalog, inventory and summarize existing data on the skipjack and yellowfin stocks of the central and western Pacific.

Action: Richard Shomura will be responsible for providing the description of the necessary activities, events and milestones for the data project in an FY80 CYTP.

d) The Center simply does not have the resources to expand the data collection efforts for billfish to bring the billfish assessments to the same level of accuracy and precision we have for tuna. In view of this, both the Oceanic Fisheries Resources Division and the Honolulu Laboratory should review their current billfish activities, most probably modify their objectives and make changes in emphasis for FY80.

Action: Gary Sakagawa will provide an updated Current Year Task Plan for FY80 reflecting the required billfish related objectives, activities and events for southern California. Richard Shomura will provide the same for the Honolulu Laboratory billfish activities.

2. Traditional-Style Stock Assessment and Analysis

The workshop attendees concluded that the SWFC's needs for carrying out traditional-style stock assessments, e.g., production models, were reasonably satisfied at this time for all major stocks except billfish and central and western Pacific skipjack and yellowfin.

a) As mentioned previously, the Center's current resources cannot be stretched to perform an adequate job of providing meaningful stock assessment for billfish. The data gathering task, on the large-scale required, is too arduous and the biological and fishery problems so complex that a "quantum leap" in available resources would be needed to tackle the problem adequately. Consequently, no further action is required for planning billfish stock assessments at this time.

b) Stock assessments for central and western Pacific skipjack and yellowfin must be improved in the near future. During the course of the year, and as the existing data become useful for planning purposes, the Honolulu Laboratory will plan for the future expansion of stock assessment work for central and western Pacific tunas. Perhaps a task or sub-task for FY81 may need to be established to cover these activities.

c) The possibility of the IATTC convention collapsing without a substitute institution in place was discussed. The necessity for having SWFC and NMFS contingency plans for carrying out the tuna stock assessment and management analysis required to support the national interest in the conservation and management of eastern tropical Pacific tunas was recognized.

Action: No specific planning action is required at this time by OFRD or the Honolulu Laboratory. The Center Director will continue to monitor the negotiations for establishing a new tuna management regime in the eastern Pacific and will call for the development of specific contingency plans should they seem necessary as the situation develops over the next few months.

3. Improved Analysis Methods, Models and Forecasting

The workshop identified six problem areas in which research efforts would yield the highest benefits for improving our tuna management advice:

a) Management modeling and forecasting

An appropriate framework or model - in so far as possible analytic - is required to aid in the systematic approach to defining the tuna management problems, for searching out possible objectives and alternatives and for defining their consequences. Such models are needed also to help keep the proper perspective on the relationships among the fishery, the environment, the fish themselves, and whatever research and management efforts may be required. Some models were developed several years ago but they have long since served their purpose and new updated models incorporating new information are required. The TPB has selected a modeling effort that involves, in the first instance, the creation of a management model for the North Pacific albacore. It is expected that the basic approach and results would also be useful for investigating the Atlantic and South Pacific albacores.

Action: Gary Sakagawa will have the lead responsibility for setting out and submitting a plan (sub-task) for the modeling effort during FY80; approximately a 1/2 man-year effort is required. Richard Shomura, Honolulu Laboratory, and Mike Laurs, Coastal Fisheries Resources Division, should be prepared to provide whatever planning information or assistance

Gary may require regarding North Pacific albacore or environmental aspects respectively. Later on, when the modeling work is underway, the Honolulu Laboratory and the Task Force will investigate the fish, fishery and environmental interactions (item f), participate actively in the modeling effort and be guided by the analysis and outcome, as will the OFRD.

b) A study of the interaction of long-line and surface fisheries

The second problem identified as a fruitful area for SWFC research involves the analysis of existing data to investigate the relationship between surface fisheries and longline fisheries. Foreign longline fisheries and domestic surface fisheries differ in the ages and sizes of fish that are vulnerable to the fishing technique thereby causing equilibrium conditions of the stock to vary as the relative mix of longline and surface fishing effort varies.

It is thought that we may gain valuable insights for better analysis and management by analyzing the various situations around the world that involve longline and surface fisheries in changing proportions. Understanding the relationship between the two types of fisheries would allow better forecasting in changes of yield from such fisheries. The data bases for southern bluefin in the Pacific, North Pacific albacore, South Pacific albacore, and eastern tropical Pacific yellowfin would all contribute to the study. Field studies may also be required and the design of these will come out of this analysis.

Action: Richard Shomura will have lead responsibility for submitting a plan (sub-task) for this generic study. The OFRD should be prepared to assist in the planning and to participate in the analysis as may be required and mutually agreed-upon between the Honolulu Laboratory and OFRD.

The preparation and communication of data for the study may be the activity requiring the most coordination.

c) The measurement of fishing effort in surface fisheries

Work is needed to produce the theoretical basis for the design of experiments that will lead to the measurement of fishing effort (fishing mortality) for purse seines, trollers and baitboats. After the theoretical bases are established, experiments and analytical techniques will need to be designed and costed out. Data from the ETP skipjack/yellowfin and North Pacific albacore fisheries will be used.

Action: The OFRD has lead responsibility for preparing the work plan involving approximately 1 man-year effort.

d) Stock identification

The "problem" of stock identification was discussed at the Workshop but a decision was made not to carry through with specific research efforts at this time. It was pointed out that the situation

regarding identification of separate stocks (sub-populations) is cloudy for Pacific albacore. Some recent work suggests that two stocks exist, which runs counter to earlier work that indicated a single Pacific-wide stock. It is expected that the value of investigating this subject more deeply might be revealed by the modeling effort in item a).

e) Analysis of multi-species or multi-stock fisheries

No proposals were offered or discussed on this subject.

f) Modeling of fish, fishery and environmental interactions
for improved management and fishery forecasting

A productive discussion about the criteria for selecting a "target" species or fishery for the modeling effort and the nature of the modeling work itself was held by the Workshop attendees; many ideas and opinions were expressed but a consensus about the exact form that the effort should take was not reached. There still may be one or two people who disagree with designating the North Pacific albacore as the target. Nevertheless, the discussion was useful and some decisions were made regarding the future course of the Center's work for establishing a better understanding of the relationships of fish to their environment and what these relations might mean for the fishery and fishery management advice.

The decisions are:

1. A Center-wide task force will be established to work on the problem.

2. It is necessary to use a "top down" approach to the modeling effort, keeping in mind the primary SWFC objective of providing the best advice we can give on the probable consequences of possible management actions and decisions. Therefore, the management modeling effort (item a) must be closely coordinated with the fish-environment work.

3. A general procedure was outlined: i) North Pacific albacore will be the first target species, ii) the task force will proceed for a designated period (roughly 2 years) at which time all planned outputs will be produced, iii) the second target species or fishery will be selected in the next few months (Atlantic and Pacific skipjack were mentioned as strong candidates), and iv) the second target species will be kept on the "back burner" so to speak, but possible changes in the data collection or analysis efforts on the second species should be anticipated, should the situation warrant it.

Action: Mike Laurs is responsible for convening a "caucus" of interested persons whose terms of reference will be to designate a procedure or protocol for the task force's planning and operations, e.g. how do we develop the overall guiding model for these fish/environment interactions and then proceed to fill in the gaps. One important item for the group to decide upon will be how to coordinate or link the task

force's efforts with the albacore management model project which will provide the overall guidance. Persons assigned to the "caucus" or scoping committee are Mike Laurs, Chairman, Andy Dizon, Dick Evans, John Hunter, Wes Parks, Dick Parrish, Gunter Seckel and Jerry Wetherall. The committee's results and plan are to be submitted to the Center Director in November 1979.

4. Tuna Data Management

The subject of tuna data management was not discussed explicitly in the Workshop. However, the Tuna Program Board did discuss the subject briefly and several differences in opinion about our current capability and future needs were surfaced. The Center Director intends to pursue this item more fully in the months ahead because of the strong belief that the tuna information and data in the Center's possession represent a major resource of the Center and NMFS. Therefore, it is the intention to act as a Center in an explicit way to preserve and enhance the value of the data and to maintain the data base in an efficient, cost-effective non-duplicative, well-managed manner as we would for any other resource of value, i.e. dollars and FTPs.

The subject of what to do about setting out a tuna data management policy and program will be discussed at the Center Management Meeting in La Jolla on October 16, 1979.

Action: ADP, OFRD, CFRD, and Honolulu Laboratory should each be prepared to present a 10-15 minute presentation that gives a synopsis of the problems from each's respective point of view and set out suggestions for arriving at a solution with the characteristics mentioned above.

PART 2: SUMMARIES OF THE TUNA SITUATION REPORTS

Overview of World Tuna Stocks of Interest to the U.S.

The staff of the Southwest Fisheries Center presented 13 situation reports which evaluated the status of stocks of the world tuna fisheries, and outlined the research efforts and needs for 23 of the world's tuna stocks.

Pacific, Atlantic and Indian Ocean tuna stocks of major significance and future potential to the United States were all reviewed.

The total annual value in the form of canned products to the U.S. of catches and imports from these stocks of tuna is \$1,288,000,000. To help put this value into perspective, it should be realized that the \$1.3 billion figure represents about 35% of the annual total revenue and expenditures of the states of Maryland or Massachusetts and nearly 100% of the annual revenue and expenditures of the states of Hawaii or Arkansas. Annual values (1978) of tuna catches and tuna imports included in the above figures are:

- canned imports \$65 million
- fresh frozen imports \$327 million
- domestic landings \$240 million

SUMMARY OF SITUATION REPORT
PACIFIC TUNAS

Stock	STATUS		
	Catches at or near MSY	Increase in catch likely	Stock Condition Uncertain
ETP Yellowfin	X		
South Pacific Albacore	X		
Pacific Skipjack		X	
Central & Western Yellowfin			X

Recent analysis of status in relation to ongoing fishing effort shows that the status of stocks of central and western Pacific yellowfin are still unknown. It appears that exploitation of skipjack tuna can be expanded safely but that catches of yellowfin in the eastern tropical Pacific and albacore in the South Pacific are already at or near maximum sustainable yields.

TABLE 1. RECAP - FISHERY DESCRIPTION AND STATUS OF STOCKS

	FISHERY				TOTAL	E. PACIFIC YELLOWFIN
	W. PACIFIC SURFACE	W. PACIFIC LONGLINE	W. PACIFIC YELLOWFIN	W. PACIFIC YELLOWFIN		
1. CATCH (Species)						
Total Annual (10 ³ M.T.)	60K + M.T.	130K M.T.	190K M.T.	180,000 S.T.		
U.S. Annual	n/a	n/a		108,000		
U.S. Imports	n/a	n/a		unknown		
General Trend	increasing	increasing		stable		
2. VALUE (10 ⁶ \$)						
Total	\$108KK	\$234KK	\$342KK	\$162KK		
U.S.	0	0	- trace -	\$ 98KK		
3. MSY						
Current State	?	?		175,000 S.T.		
Trend and Potential	probable growth potential	probably fully exploited				
4. CURRENT MGT/RESEARCH	No Mgt., No records	No Mgt., Japanese records		IATTC		
5. MAJOR PARTICIPANTS (3)	Philippines, Indonesia, Japan	Japan, Taiwan Korea		U.S., Mexico Panama		
6. U.S. RESEARCH EFFORT/M.Y.	0	0		0		
7. OVERALL TREND IN S.O.S.	Possibly growth overfishing may be worsening	Probably fully utilized may be worsening		Fished at about equilibrium yield		

TABLE 2. RECAP - FISHERY DESCRIPTION AND STATUS OF STOCKS

FISHERY "South Pacific Albacore" & American Samoa Fishery		ALBACORE				BILLFISH, ETC.	
		SURFACE	LONGLINE	YELLOWFIN	BIGEYE		
1. CATCH (Species)							
Total Annual (10 ³ MT)		1	35	n/a	n/a		n/a
U.S. Annual		0	0	0	0		0
U.S. Imports		?	35	n/a	n/a		0
General Trend		Increasing	Steady	n/a	n/a		n/a
2. VALUE (10 ⁶ \$)							
Total		1.5	54	n/a	n/a		n/a
U.S.		0	0	0	0		0
3. MSY (10 ³ MT)		?	35	?	?		-
Current State		under exploited	Fully exploited	probably fully exploited	probably fully exploited		-
Trend and Potential		potential for expansion	down if Surface fishing grows	no growth likely	some growth likely		-
4. CURRENT MGT/RESEARCH		no mgt., some research by New Zealand	no mgt., U.S. monitoring and stock assessment	none	none		Billfish U.S. FMP in preparation
5. MAJOR PARTICIPANTS (3)		New Zealand & Chile	Taiwan, Korea, Japan	Korea, Taiwan, Japan	Korea, Taiwan, Japan		Taiwan, Korea, Japan
6. U.S. RESEARCH EFFORT/M.Y.		0	0.5	0	0		0.1
7. OVERALL TREND IN S.O.S.		Underutilized healthy	Fully utilized but healthy	?	?		No problem

TABLE 3. RECAP - FISHERY DESCRIPTION AND STATUS OF STOCKS

	FISHERY		
	EASTERN PACIFIC SKIPJACK	WESTERN PACIFIC SKIPJACK	TOTAL PACIFIC SKIPJACK
1. CATCH (Species)			
Total Annual	120K M.T.	400K M.T.	320K M.T.
U.S. Annual	75K, M.T.	0	75K M.T.
U.S. Imports	N/A	N/A	
General Trend	Increasing	Steady ?	
2. VALUE (10^6 \$)			
Total	\$84KK	\$280KK	\$364KK
U.S.	\$52.5KK	\$3.5KK	\$56KK
3. MSY			
Current State	?	?	
Trend and Potential	probably under- utilized		
4. CURRENT MGT/RESEARCH	No Mgt., Research by IATTC, NMFS	No Mgt., Research by PNG, SPG, Japan	
5. MAJOR PARTICIPANTS (3)	U.S., Ecuador, Panama	Japan, Philippines, Indonesia	
6. U.S. RESEARCH EFFORT/M.Y.	3	0	
7. OVERALL TREND IN S.O.S.	Healthy, Room for further growth in catch	Healthy, room for further growth	Further growth possible

TABLE 4. RECAP OF DATA QUALITY/ADEQUACY

FISHERY WESTERN PACIFIC YELLOWFIN		LONGLINE		
	SURFACE			
A. FISHERY DATA	● CATCH (Species)	Poor, inadequate	Fair, Adequate	
	● EFFORT	Awful, inadequate	Fair, Adequate	
	● SIZE/AGE COMPOSITION	Awful, inadequate	Poor, Inadequate	
B. RESEARCH/EXPERIMENTAL	● TAGGING	None; would be useful	None	
	● STOCK IDENTIFICATION	Some information inadequate	Some information inadequate	
	● PHYSIOLOGICAL PARAMETERS	Growth estimates available, and "adequate", mortality unavailable but needed (cohort analysis)		
C. ENVIRONMENTAL	?	?		

TABLE 5. RECAP OF DATA QUALITY/ADEQUACY

FISHERY EASTERN PACIFIC YELLOWFIN

A. FISHERY DATA	● CATCH (Species)	Very good			
	● EFFORT	Very good			
	● SIZE/AGE COMPOSITION	Very good			
B. RESEARCH/EXPERIMENTAL	● TAGGING	good			
	● STOCK IDENTIFICATION	good			
	● PHYSIOLOGICAL PARAMETERS	n/a			
C. ENVIRONMENTAL					

TABLE 6 RECAP OF DATA QUALITY/ADEQUACY

FISHERY		PACIFIC SKIPJACK		
		EASTERN	WESTERN	
A. FISHERY DATA	● CATCH (Species)	Good, adequate	Fair, inadequate	
	● EFFORT	Poor, inadequate	Poor, inadequate	
	● SIZE/AGE COMPOSITION	Good, adequate	Poor, inadequate	
B. RESEARCH/EXPERIMENTAL	● TAGGING	Tagging by IATTC	Tagging by SPC, PNG, Japan	
	● STOCK IDENTIFICATION	Some information inadequate	Some information inadequate	
	● PHYSIOLOGICAL PARAMETERS	Several growth models available, other information lacking?		
C. ENVIRONMENTAL		?	?	

TABLE 7. RECAP OF DATA QUALITY/ADEQUACY

		FISHERY "SOUTH PACIFIC ALBACORE"				
A. FISHERY DATA		ALBACORE				BILLFISH, ETC.
		SURFACE	LONGLINE	YELLOWFIN	BIGEYE	
● CATCH (Species)		Good, adequate	Fair, adequate	Fair, adequate	Fair, adequate	Fair, adequate
	● EFFORT	Fair, adequate	Fair, adequate	Fair, adequate	Fair, adequate	Fair, adequate
	● SIZE/AGE COMPOSITION	Fair, inadequate	Good, inadequate	None, inadequate	None, adequate	None, adequate
B. RESEARCH/EXPERIMENTAL	● TAGGING	possible but only a few tagged by S.P.C.	none	none	none	none
	● STOCK IDENTIFICATION	Some info inadequate			Some info, adequate	
	● PHYSIOLOGICAL PARAMETERS	Non-existent and inadequate				
C. ENVIRONMENTAL		?				

TABLE 8. PROBLEMS/RESEARCH NEEDS

FISHERY: EASTERN PACIFIC YELLOWFIN

Eastern Pacific Yellowfin

- What is U.S. obligation in the event of the demise of IATTC?
- Analysis to determine best management option for changing age composition of catch to older fish 1/2 man-yr.
- Is U.S. adequately reviewing/monitoring work of IATTC?

TABLE 9. PROBLEMS/RESEARCH NEEDS

FISHERY: WESTERN PACIFIC YELLOWFIN	
<u>Western Pacific Yellowfin</u>	
1) Assemble available data (catch size composition, CPUE)	2 mm
2) Assess stock and effects of expanding surface fishery	6 mm
3) Expand data bases for Phillipines, Korea, etc., and U.S. operations	?
4) Develop effective effort measures for surface fisheries	12 mm Task Force

TABLE 10. PROBLEMS/RESEARCH NEEDS

SOUTH PACIFIC ALBACORE

1) Expand Pago Pago sampling (design and set-up) - include yellowfin and bigeye	2 mm
2) Examine biases in production model analysis (simulation)	2 mm
3) Consider tagging small albacore off New Zealand	? Joint project with New Zealand
4) Strengthen data from other bases such as Fiji, New Herbrides	?

TABLE 11. PROBLEMS/RESEARCH NEEDS

FISHERY: PACIFIC SKIPJACK

<u>EASTERN AND WESTERN</u>	Cost
1) Develop effective effort measure	12 mm Task Force
2) Summarize available catch, CPUE, size composition data	6 man months (mm)
3) Stock identification, explore new techniques	?
<u>Western</u>	
1) Expand data bases for Phillipines, etc., and U.S. operations	?

NORTH PACIFIC ALBACORE

The Pacific albacore population is assumed to be composed of two major stocks, one north and another south of the equator. In the North Pacific fishery, the general trend in catch from 1961 to 1977 was upward. The North American fishery catches from 1961 to 1977 average slightly more than 20,000 MT and were fairly stable until 1977 when a low catch of 12,000 MT was recorded. The ex-vessel value of the albacore catch average \$126 million per year from 1973-1977 with the U.S. fishery receiving \$25 million per year over the same period. Currently, there are no fisheries management regulations in force for North Pacific albacore.

The U.S. has a domestic fishery operating on the North Pacific albacore stock. Imports of albacore far exceed the domestic caught supply and some of these imports come from the North Pacific albacore stock.

Currently, most of the research on the North Pacific albacore stock is conducted by NMFS, La Jolla and the Tohoku and Far Seas Fisheries Research Laboratories, Japan. The data quality is generally good with longline catch and effort data very good, especially for later years.

Using conventional techniques, the production model analyses indicate that a conservative estimate of MSY is 125,000 MT.

Among data and research needs, the recent Fourth North Pacific Albacore Workshop pointed out that those recommendations leading to stock assessment research which should receive emphasis are age structure based models. Concurrent environmental research should emphasize investigations into quantifying key oceanographic processes and parameters affecting vulnerability and availability and their effects on catch per unit of effort measures.

Because of the importance of the North Pacific albacore stock to U.S. fishermen and the current low level of reliability of estimates, the need is evident for increased management-related research.

TABLE 12. RECAP - FISHERY DESCRIPTION AND STATUS OF STOCKS

FISHERY NORTH PACIFIC TUNAS

	BLUEFIN	ALBACORE		
1. CATCH (Species)				
Total Annual (M.T.)	Not reported	124,000 (1976) 57,000 (1977)		
U.S. Annual		20,000 (10%-20%)		
U.S. Imports		40%-50% of 40,000		
General Trend		1961-77 upward 1976-77 drop $\frac{1}{2}$		
2. VALUE		\$		
Total	Not reported	1973-77 126KK		
U.S.		25KK		
3. MSY		125,000 MT?		
Current State	Unknown	May be beyond MSY		
Trend and Potential		Uncertain recruitment apparently down		
4. CURRENT MGT/RESEARCH		Japan 3 man years USA 65 man years		
5. MAJOR PARTICIPANTS (3)		Japan, USA, Taiwan		
6. U.S. RESEARCH EFFORT/M.Y.		6.5 man years		
7. OVERALL TREND IN S.O.S.		apparently steady with uncertainty due to effort problems		

TABLE 13. RECAP OF DATA QUALITY/ADEQUACY

FISHERY		NORTH PACIFIC TUNAS	
A. FISHERY DATA	BLUEFIN	ALBACORE	
		unknown quantity unknown quality Some	
● CATCH (Species)			Good
● EFFORT		Some	Fair
● SIZE/AGE COMPOSITION		Some	Good
B. RESEARCH/EXPERIMENTAL			
● TAGGING		None	Good
● STOCK IDENTIFICATION			SVB Stocks proposed
● PHYSIOLOGICAL PARAMETERS			Good
C. ENVIRONMENTAL			Good

SUMMARY OF SITUATION REPORTS ATLANTIC TUNAS

Recent catches (circa-1977) compared to estimated maximum sustainable average yield (MSAY) for seven stocks of Atlantic tunas indicates that opportunities for significant increases in catch may be possible only for the western stock of Atlantic skipjack.

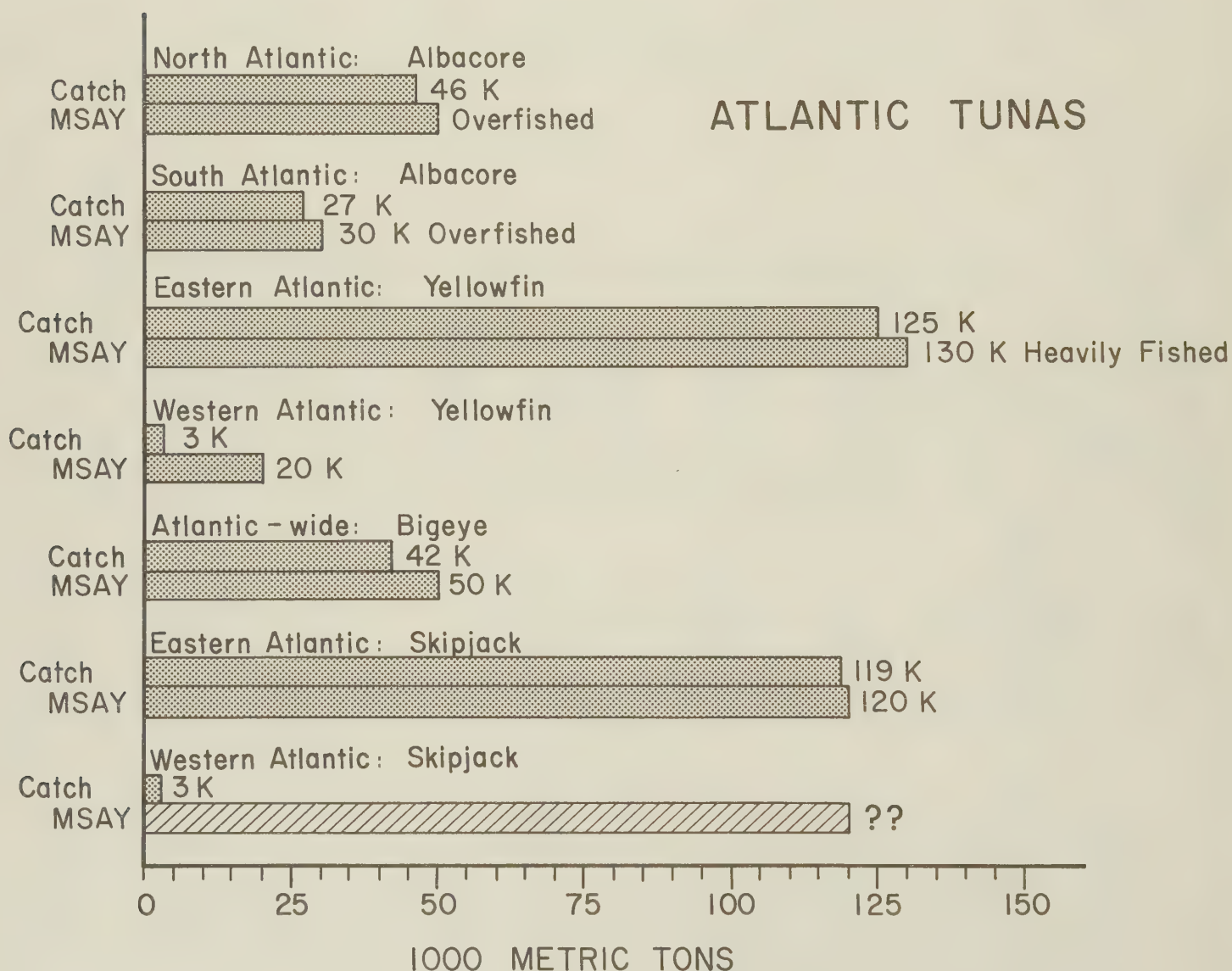


TABLE 14. RECAP - FISHERY DESCRIPTION AND STATUS OF STOCKS

FISHERY ATLANTIC TUNA

	ALBACORE	YELLOWFIN	BIGEYE	SKIPJACK
1. CATCH (Species)				
Total Annual	N - 46K S - 27K } 73K	125 K - E 3 - W	42K	119 - E 122K 3 - W
U.S. Annual	- 0 -	8K	0.3K	8.5K
U.S. Imports	- 30.35K -	22K	2K	40K (Min)
General Trend	Down	Up-slow	slight decrease	erratic-up
2. VALUE				
Total	\$100KK	\$135KK	\$45KK	\$74KK
U.S.	\$41KK IMP.	\$9KK catch \$20KK IMP.	\$5KK catch \$24KK IMP.	
3. MSAY	N - 50K S - 30K overfished	90 - 130K (mean) 20K - W heavy fished	49-50K At MSY	90 - 120K - E Poor fit consensus-under-fished
Trend and Potential	N. Decline S. Stable	Some increased effort	Steady to lower	Increased.
4. CURRENT MGT/RESEARCH	ICCAT	ICCAT	ICCAT	ICCAT
5. MAJOR PARTICIPANTS (3)	France, Spain Taiwan	France, Spain, Japan	Japan, Cuba, USSR	France, Spain Japan
6. U.S. RESEARCH EFFORT/M.Y.	0.5	0.5	0.5	1.0
7. OVERALL TREND IN S.O.S.	getting worse MSY & recruitment problems	Steady	Steady	uncertain

TABLE 15. RECAP OF DATA QUALITY/ADEQUACY

	FISHERY ATLANTIC			
	ALBACORE	BIGEYE	YELLOWFIN	SKIPJACK
A. FISHERY DATA				
● CATCH (Species)	Good	Good	Good	Good
● EFFORT	Good - Fair	Good - Fair	Good	Good
● SIZE/AGE COMPOSITION	Good	Good - Fair	Good	Fair
B. RESEARCH/EXPERIMENTAL				
● TAGGING	Fair	-	Fair	Fair
● STOCK IDENTIFICATION	Fair	-	Poor	Poor
● PHYSICAL PARAMETERS	unknown	unknown	unknown (Pac. yes)	unknown (Pac. yes)
C. ENVIRONMENTAL				

TABLE 16. PROBLEM/RESEARCH NEEDS

TASKS	ATLANTIC				PACIFIC	
	ALBACORE	BIGEYE	SKIPJACK	YELLOWFIN	ALBACORE	PACIFIC
<u>Monitor Status of Stocks (Man months)</u>	.2	.2	.2	.2		1.0
catch effort analysis	X	X	X	X		X
gear interaction						
alternate effort standardization						
Estimate MSY via Production Model Analysis	X	X	X	X		X
alternate stock structure hypothesis						
alternate effort standardization						
Recruitment analysis						
c(age R)/f analysis cohort analysis						
+ alternate M(A) models						
+ alternate stock structures H_0						
Probability (Recruitment failure)						
alternative spawner/recruit relation forms						
Yield/Recruit analysis	X	X	X	X		X
alternate stock structure H_0						
alternate M(A) models						
<u>Effects of alternative Management</u>	.25	.1	.1	.1		(?)
Equilibrium analysis of effects of quota, size, limit and effort regulation		X	X	X		
Non-equilibrium age-structured analysis of effects of quota size limit and effort regulation	X			X		

TABLE 16. (Continued)

	ATLANTIC		SKIPJACK	YELLOWFIN	PACIFIC	
	ALBACORE	BIGEYE			ALBACORE	
Non-equilibrium, for multi-stock, multi-fishery system		X (.5)	X	X	X (3?)	
Identify and quantify key environmental variables and their effect on status of stocks.	.45	.3	.3	.3	1 (.3)	

SUMMARY OF SITUATION ON INDIAN OCEAN TUNAS

None of the tunas in the Indian Ocean is under management and at this time no management plans are contemplated for any of the Indian Ocean tunas.

Research on Indian Ocean tunas, caught by longline, has been conducted mainly by the Far Seas Fisheries Research Laboratory; production model analyses on Indian Ocean albacore, bigeye tuna and yellowfin tuna have been completed at the Southwest Fisheries Center's Honolulu Laboratory; systematics, biology and fishery biology are conducted at the Central Marine Fisheries Research Institute, Mandapam Camp, India, and at the Fishery Research Station, Sri Lanka.

America interests are not currently directly involved in fishing in the Indian Ocean; the importance of the area is as a potential source of supply of tuna for such U.S. competitors as Japan.

Although the U.S. has no present direct stake in the Indian Ocean tuna fisheries, the Southwest Fisheries Center will continue to monitor the Indian Ocean tuna situation for potential U.S. involvement.

A RECAPITULATION OF RECENT CATCHES BY COUNTRY AND SPECIES

INDIAN OCEAN

<u>Species</u>	Catch (MT) - Year 1976
Albacore	14,937
Bigeye	28,246
Yellowfin	46,336
Skipjack	38,378

FOREIGN COUNTRIES FISHING IN INDIAN OCEAN

(1976 Catch for Albacore, Bigeye, Yellowfin;
Skipjack catches not included)
(1,000 MT)

Korea	- 37.6	<u>Unknown ?</u>
Taiwan	- 14.6	Australia
Oman	- 8.3	Bangladesh
Japan	- 7.6	India
Yemen	- 7.6	
Sri Lanka	- 5.0	
Maldives	- 4.8	
U.S.S.R.	- 2.0	
Madagascar	- 1.7	
Pakistan	- 0.2	
Seychelles	- 0.1	
	89.5	

TABLE 17. RECAP - FISHERY DESCRIPTION AND STATUS OF STOCKS

FISHERY Indian Ocean Tunas				
	ALBACORE	BIGEYE	YELLOWFIN	SKIPJACK
1. CATCH (Metric tons)				
Total Annual (1976)	28,250	38,709	88,121	41,304
U.S. Annual	-	-	-	-
U.S. Imports	13,000	-	-	-
General Trend	Rising until 1966. Highly variable since.	Rising until 1968. Highly variable since.	Rising until 1969. Steady about 40 K MT since.	20 K MT (1965-73) 35 K MT (1974-77)
2. VALUE (U.S. dollars)				
Total (Japanese) 183 yen to dollar	\$30,000,000	\$70,000,000	\$120,000,000	\$150,000,000
U.S.	-	-	-	-
3. MSY				
Current State (MT)	15 K - 20 K	-	40 K - 60 K	-
Trend and Potential	-	-	-	-
4. CURRENT MGT/RESEARCH	FSFRL Central Marine Fishery Research Institute			
5. MAJOR PARTICIPANTS (3)	Japan,	Korea,	& Taiwan	
6. U.S. RESEARCH EFFORT/M.Y.	Trace			
7. OVERALL TREND IN S.O.S.	No danger	-	No danger	-

TABLE 18. RECAP OF DATA QUALITY/ADEQUACY

	INDIAN OCEAN TUNAS			
	FISHERY	BIGEYE	YELLOWFIN	SKIPJACK
A. FISHERY DATA				
● CATCH (Species)	Good	Good	Incomplete	Incomplete
● EFFORT	Good	Good	Incomplete	Incomplete
● SIZE/AGE COMPOSITION	?	?	?	?
B. RESEARCH/EXPERIMENTAL				
● TAGGING	None	None	None	None
● STOCK IDENTIFICATION	?	?	?	?
● PHYSIOLOGICAL PARAMETERS	None	None	None	None
C. ENVIRONMENTAL				
	-	-	-	-

TABLE 19. PROBLEM/RESEARCH NEEDS

FISHERY			INDIAN OCEAN TUNAS
ALBACORE	BIGEYE	YELLOWFIN	SKIPJACK
Determine data needed for stock assessment	Relationship between Bandu Sea and Indian Ocean populations	Sensitivity simulation studies. Estimate mortality coefficients, 1/2yr.	
		Determine changes in effectiveness of fishing gear.	
		Apply production model analysis to catch in numbers of fish and fishing effort 1/2 yr.	
		Determine hypothetical yields for new fishing strategies.	

SUMMARY OF SITUATION REPORT ON PACIFIC BILLFISH

Centers of fishery activity for the various species are: Mexico, New Zealand, and California for striped marlin; Hawaii, Tahiti, and Guam for blue marlin; and Australia and Chile for black marlin. The major commercial fisheries for the three species are conducted by the longline and harpoon fishermen of Japan, Taiwan, and Korea. American participants are the commercial longline fishermen of Hawaii and recreational fishermen primarily from California, Hawaii and Guam.

The 1976 catches of these three species in the Pacific were: 17,032 MT of striped marlin; 14,813 MT of blue marlin, and 3,182 MT of black marlin. The Japanese longliners have by far the largest catch of marlins of the countries fishing for them. The prices from January 1978 to May 1979 show striped marlin to be the most valuable of the three species.

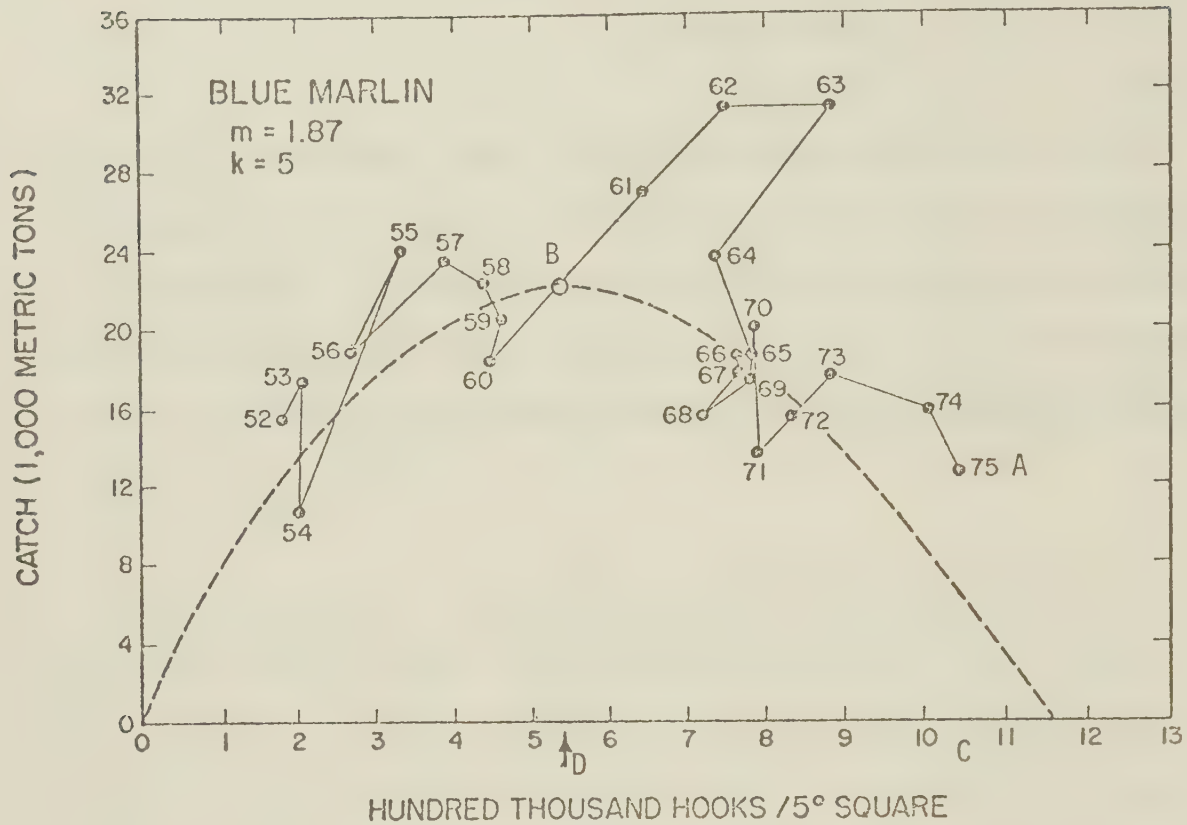
The marlins are under no management scheme at present. U.S. interest is primarily recreational, although the commercial aspects are not ignored.

Based on steadily decreasing CPUE with increasing fishing effort, the blue marlin stock is judged to be overfished. If the striped marlin is assumed to be two stocks, the picture for the North Pacific stock is unclear while the South Pacific stock is being fished at about optimum level. A meaningful evaluation of the stocks of black marlin is not feasible.

The current population assessments were based on incomplete catch and effort data for three species; all assessments need improvement, particularly those for black marlin.

Data, research and management needs are more urgent for the blue marlin because of its apparent overfished condition. Restrictive regulations may be needed to manage the blue marlin properly. Presently no management measures appear to be necessary for striped marlin. There is uncertainty about the need for management of the black marlin.

PACIFIC BLUE MARLIN
(an example of an "overexploited" fishery)



The blue marlin catch of 15,000 MT in 1975 (point A) was approximately 7,000 tons below maximum sustainable yield of 22,000 MT (point B) while approximately twice as much effort of 1.1 million hooks (point C) is being expended than is required to catch maximum yield at equilibrium condition of 5.5 million hooks (point D).

TABLE 20. RECAP - FISHERY DESCRIPTION AND STATUS OF STOCKS

FISHERY PACIFIC OCEAN MARLIN & SWORDFISH				
1. CATCH (Species)	STRIPED MARLIN	BLUE MARLIN	BLACK MARLIN	SWORDFISH
Total Annual	17,032 M.T.	14,813 M.T.	3,182 M.T.	17,190 M.T.
U.S. Annual	109	550	95	230 (AV)
U.S. Imports	0	0	0	93 (per 1979)
General Trend	Stable	Down	Slightly Down	Upward
2. VALUE (ex-vessel)				
Total	\$54KK	\$36KK	\$6KK	\$50KK
U.S.		\$643K		\$4KK
3. MSY				
Current State	24,000 M.T.	22,000 M.T.	unknown	20,000 M.T.
Trend and Potential	Stable/Inc.	Down/none	Stable/little	Inc./Inc.
4. CURRENT MGT/RESEARCH	NMFS FSFRL	NMFS FSFRL	NMFS FSFRL NSW ()	NMFS CF&G FSFRL
5. MAJOR PARTICIPANTS (3)		Japan/Korea/Taiwan		
6. U.S. RESEARCH EFFORT/M.Y.		1 1/2		1 1/2
7. OVERALL TREND IN S.O.S.	underfished	underfished	at/New Mex. yield	underfished

TABLE 21. RECAP OF DATA QUALITY/ADEQUACY

		FISHERY PACIFIC OCEAN MARLIN & SWORDFISH			
		STRIPED MARLIN	BLUE MARLIN	BLACK MARLIN	SWORDFISH
A. FISHERY DATA	● CATCH (Species)	Good	Good	Good	Good
	● EFFORT	Fair	Fair	Fair	Fair
	● SIZE/AGE COMPOSITION	Some	Some	Unknown	Some
B. RESEARCH/EXPERIMENTAL	● TAGGING	Good/E. Pacific	negligible	Good/Sw. Pacific	negligible
	● STOCK IDENTIFICATION		hypothetical		
	● PHYSIOLOGICAL PARAMETERS		inadequate		Day/night patterns
C. ENVIRONMENTAL Parameters		Some	none	some	none

Table 22. Problem/Research Needs

Pacific Billfish (Multi-species)

Pacific Billfish (Multi-species)									
0 Needs	Species	Striped marlin	Blue marlin	Man years	Black marlin	Swordfish			
Age and growth		* Verification	* Verification	* Study	** Study	** Study			
			1½						
Log data									
● Catch									
● Effort									
Stock Structure		** U.S./Foreign	** U.S./Foreign	* --/Foreign	** U.S./Fore				
			½						
● Spawning areas		** Study	* Verification	* Verification	** Study				
● Migration		* Verification	** Study	* Verification	** Study				
- stock interchange			1½						
Catch Composition		** Study	** Study	* Needed	** Study				
			1						
Availability Patterns		** Study	** Study	* Needed	** Study				
			½						

Manpower (Additional) 5 MY at \$18K/MY

Vessel time (months)

3 mos (NOS) N/C

2 mos (charter) 30 K

Cost estimate - P = \$90,000
Vessel C = 30,000

\$ 120,000 ±

TABLE 23. RECAP - FISHERY DESCRIPTION AND STATUS OF STOCKS

	FISHERY INDIAN OCEAN BILLFISH				
	BLUE MARLIN	STRIPED MARLIN	BLACK MARLIN	SWORDFISH	SAILFISH
1. CATCH (Species)					
Total Annual (combined)			8,000 M.T. all spp.		
U.S. Annual	-	-	-	-	-
U.S. Imports	-	-	-	-	-
General Trend	Falling since 1970	Widely variable since 1965	Widely variable	Falling since 1970	Falling since 1967.
2. VALUE					
Total		\$20, 000, 000			
U.S.	-	-	-	-	-
3. MSY					
Current State	3.5K	3.5K	1.5K	-	-
Trend and Potential	Unknown	More possible	More possible	More possible	More possible.
4. CURRENT MGT/RESEARCH	Minimal	FSRL, Cen. Mar.	Fish. Res. Institute		
5. MAJOR PARTICIPANTS (3)	Japan, Taiwan, Korea				
6. U.S. RESEARCH EFFORT/M.Y.	Minimal.				
7. OVERALL TREND IN S.O.S.	Underfished				

TABLE 24. RECAP OF DATA QUALITY/ADEQUACY

	FISHERY INDIAN OCEAN BILLFISH				
	BLUE MARLIN	STRIPED MARLIN	BLACK MARLIN	SWORDFISH	SAILFISH
A. FISHERY DATA					
● CATCH (Species)	Good	Good	Good	Good	Good
● EFFORT	Good	Good	Good	Good	Good
● SIZE/AGE COMPOSITION	n/a	n/a	n/a	n/a	n/a
B. RESEARCH/EXPERIMENTAL					
● TAGGING	none	none	none	none	none
● STOCK IDENTIFICATION	?	?	?	?	?
● PHYSIOLOGICAL PARAMETERS	-	-	-	-	-
C. ENVIRONMENTAL					

TABLE 25. PROBLEM/RESEARCH NEEDS

FISHERY: INDIAN OCEAN BILLFISH

- Identification of stock units for all species
- Separate reporting of sailfish and shortbill spearfish
- Resolve misreporting of blue and black marlins in catch statistics

SWFC WORKSHOP ON TUNA RESEARCH PLANNING

LIST OF ATTENDEES:

SWF Center Director's Office

I. Barrett, Center Director

J. Carr

D. Mackett

L. Vlymen

Honolulu Laboratory

R. Shomura, Laboratory Director

G. Liao

F. Riggs

J. Wetherall

M. Yong

H. Yoshida

H. Yuen

Oceanic Fisheries Resources Division

G. Sakagawa, Division Chief

W. Parks

N. Bartoo

A. Coan

R. Rinaldo

J. Squire

E. Weber

Coastal Fisheries Resources Division

M. Laurs

SW Regional Office

G. V. Howard, Regional Director

J. G. Smith

Office of Science and Environment

A. Vrooman

SWFC Workshop on Tuna Research Planning

San Clemente, California

September 11-13, 1979

LIST OF SITUATION REPORTS PRESENTED

SessionI ATLANTIC TUNAS N. Bartoo, Rapporteur

- ATL-1 Situation Report for Atlantic Albacore
 Norman Bartoo, OFRD
- ATL-2 Situation Report on Atlantic Yellowfin Tuna
 Atilio Coan, OFRD
- ATL-3 Situation Report for Atlantic Bigeye Tuna
 Earl Weber, OFRD
- ATL-4 Atlantic Skipjack Tuna Situation Report
 Ronald Rinaldo, OFRD

II INDIAN OCEAN TUNAS H. Yuen, Rapporteur

- IND-1 Situation Report on Albacore, Bigeye Tuna, Skipjack
 Tuna, and Yellowfin Tuna in the Indian Ocean
 Howard O. Yoshida, Honolulu Laboratory
- BILL-1 Situation Report on Billfishes of the Indian Ocean
 Heeny S.H. Yuen, Honolulu Laboratory

III NORTH PACIFIC TUNAS R. Rinaldo, Rapporteur

- NPAC-1 Situation Report for North Pacific Albacore
 Norman Bartoo, OFRD
- NPAC-2 Situation Report on North Pacific Bluefin Tuna
 Not written

IV CENTRAL & WESTERN PACIFIC-TUNAS J. Wetherall, Rapporteur

- CWP-1 Situation Report on South Pacific Albacore
 Howard O. Yoshida, Honolulu Laboratory
- CWP-2 Situation Report on Yellowfin Tuna in the
 Western Pacific Ocean
 Howard O. Yoshida, Honolulu Laboratory
- CWP-3 Situation Report on Skipjack Tuna in the Pacific
 Howard O. Yoshida, Honolulu Laboratory

V EASTERN-PACIFIC YELLOWFIN TUNA H. Yuen, Rapporteur

- EP-1 Situation Report for Eastern Pacific
 Yellowfin Tunas
 Atilio Coan & Ronald Rinaldo, OFRD

VI BILLFISH J. Squire, Rapporteur

- *BILL-1 Situation Report on Billfishes of the Indian Ocean
 Heeny S.H. Yuen, Honolulu Laboratory

 *Presented also in session on Indian Ocean Tunas
- BILL-2 Situation Report on Striped, Blue and Black
 Marlins in the Pacific Ocean
 Heeny S. H. Yuen, Honolulu Laboratory
- BILL-3 Situation Report on Swordfish of the Pacific Ocean
 James Squire, OFRD

SWFC WORKSHOP ON TUNA RESEARCH PLANNING

SAN CLEMENTE INN
SAN CLEMENTE, CALIFORNIA

SEPTEMBER 10-13, 1979

AGENDA & SCHEDULE

MONDAY - SEPTEMBER 10

- 1530 - Vans leave La Jolla for San Clemente L. Vlymen
- 1630 - Check In, San Clemente Inn
- 1800 - Attitude Adjustment Hour Hosted
by SWFC Director

TUESDAY - SEPTEMBER 11

- 0800 - Workshop Objectives I. Barrett
- Agenda, Schedule & Procedures D. Mackett
- 0900 - Situation Reports - Presentation &
Discussion Session
- Atlantic Tunas Rapporteur: N. Bartoo
- 1000 - Coffee
- 1015 - ● Atlantic Tunas (Continued)
- 1200 - Lunch
- 1330 - ● Indian Ocean Tunas Rapporteur: H. Yuen
- 1500 - Coffee
- 1515 - ● North Pacific Tunas Rapporteur: R. Rinaldo
- 1700 - Tuna Program Board Meets with Rapporteurs
for approximately 1/2 hour to review
first day's session
- 1830 - Dinner - No Speeches -

WEDNESDAY - SEPTEMBER 12

0800 - Presentation & Discussion Session

- Central & Western Pacific Tunas

Rapporteur: J. Wetherall

- 1100 - ● Eastern Pacific Yellowfin
(include with C&W Pacific Tunas)

Rapporteur: H. Yuen

1200 - Lunch

- 1330 - ● Pacific Billfish

Rapporteur: J. Squire

1500 - R&R: Tennis, Swimming, Beach Combing

1530 - T.P.B. Meets with Rapporteurs

THURSDAY - SEPTEMBER 12

0800 - Rapporteurs' Reports

- Data & Research Needs for Each Major Group of Tunas

Director's Preliminary Evaluation

I. Barrett

- Priorities - Base Funding
New Funding

- Ecosystem Program: Targets & Organization

Discussion

Assignments for Writing the Planning Documents

I. Barrett

P.M. - Check-Out: Vans leave for La Jolla

NOTE: Typing services will be available for producing Rapporteur's reports on Wednesday evening if required.

SWFC TUNA RESEARCH WORKSHOP

Rough Estimate of Time	TUESDAY SEPTEMBER 11		WEDNESDAY SEPTEMBER 12		THURSDAY SEPTEMBER 13	
	OBJECTIVES, AGENDA SCHEDULE & PROCEDURES		C&W PACIFIC TUNAS J. Wethera ¹¹		• RAPORTEUR'S REPORTS ON DATA AND RESEARCH NEEDS FOR EACH GROUP OF TUNAS (6)	
0800	ATLANTIC TUNAS PRESENTATIONS & DISCUSSION					
0900						
Coffee	ATLANTIC TUNAS (CONTINUED)		C&W PACIFIC TUNAS (CONTINUED)		• DIRECTOR'S PRELIMINARY EVALUATION	Coffee
1100	N. Bartoo		E. PACIFIC YELLOWFIN H. Yuen		• DISCUSSION • ECOSYSTEM • ASSIGNMENTS	1200
1200	LUNCH		LUNCH		LUNCH	1330
1330	INDIAN OCEAN TUNAS H. Yuen		PACIFIC BILLFISH J. Squire		• WORK PLAN WRITE-UPS BY WORKING PARTIES DUE SEPTEMBER 28 IN THE DIRECTOR'S OFFICE	
1530	NORTH PACIFIC TUNAS R. Rinaldo		BILLFISH (CONCLUDED)			
1700	MEET AT END OF SESSION FOR 1/2 HOUR WITH RAPORTEURS		R & R			1700
TDB			MEET AT 1530 WITH RAPORTEURS			

- DINNER -

DM:7/22/79

SWFC WORKSHOP ON TUNA RESEARCH
SEPTEMBER 11-13

WORKSHOP PROCEDURE

BACKGROUND INFORMATION --

WE HAVE:

- 13 SITUATION REPORTS = N_R
- 23 SPECIES OF STOCKS OF TUNA & BILLFISH = N_S
- ~12 HOURS FOR PRESENTATION AND DISCUSSION = T_P
- 3 HOURS FOR RECAP AND ASSIGNMENTS = T_R
- 2.0 HOURS STRETCH, COFFEE, ETC. = T_C

THEREFORE,

AVE TIME PER REPORT PRESENTATION & DISCUSSION =

$$T_R = (T_P - T_C) / N_R = (12 - 2) / 13 = .76 \text{ HRS} \\ = 45.6 \text{ MIN}$$

AVE TIME PER SPECIES OR STOCK =

$$T_S = (T_P - T_C) / N_S = (12 - 2) / 23 = .43 \text{ HRS} \\ = 25.8 \text{ MIN}$$

PROCEDURE:

1. LISTING OF QUESTIONS, PROBLEMS, ITEMS OF CONCERN FROM THE FORMS SUBMITTED BEFORE PRESENTATION.

PLANNING OFFICER, RAPPORTEUR,
AUTHOR/PRESENTER

2. PRESENTATION OF SITUATION REPORT:

5-25 MINUTES

3. POSTING OF QUESTIONS FOLLOWED BY DISCUSSION (IF QUESTION WAS NOT ANSWERED EXPLICITLY IN PRESENTATION).
SUBMITTED WRITTEN QUESTIONS GIVEN PRIORITY.

AUTHOR/PRESENTER ET AL

4. IF TIME PERMITS: ROUND ROBIN RECORDING OF ITEMS OR QUESTIONS REMAINING, FOLLOWED BY DISCUSSION. QUESTIONS OF CENTER DIRECTOR, DIRECTOR OF HONOLULU LABORATORY, AND DIVISION CHIEF, OFRD GIVEN PREFERENCE.

5. AFTER LAST REPORT FOR SESSION, E.G., ATLANTIC TUNAS:
ROUND ROBIN RECORDING OF COMMENTS, PROBLEMS, QUESTIONS OR OTHER ITEMS THAT RAPPORTEURS SHOULD TRY TO ADDRESS IN WRAP-UP REPORT ABOUT RESEARCH NEEDS AND PLANS FOR SPECIES GROUP OR FISHERY.

15 MINUTES

6. THE TUNA PROGRAM BOARD WILL BE RATING THE SITUATION AND RESEARCH PROGRAM NEEDS (NOT THE SPEAKERS AND AUTHORS!) ACCORDING TO THE CRITERIA THAT WERE AGREED UPON AND CIRCULATED EARLIER; FORMS FOR THIS RATING ARE AVAILABLE. EVERYONE IS FREE TO "KEEP SCORE" BUT THE TUNA PROGRAM BOARD'S CONSENSUS RATING AND RANKING WILL BE THE ONLY ONE THAT COUNTS.
7. NIGHT SESSION(S) WILL BE AVOIDED BUT TIME WILL BE AVAILABLE IF NEEDED.
8. DISCUSSION OF THE TPB'S FINDINGS AND SUGGESTED PROGRAM EMPHASIS WILL FOLLOW THE RAPPORTEUR'S REPORTS ON THURSDAY MORNING.
9. ASSIGNMENTS WILL BE MADE FOR COMPLETING MORE DETAILED WORK PLANS.
10. A DISCUSSION OF TUNA ECOSYSTEMS, OBJECTIVES AND TARGETS WILL BE HELD ON THURSDAY MORNING.

30 MINUTES

